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D.V. SAVEL'EV

STUDY OF THE SPECIES COMPOSITION AND THE DYNAMICS OF THE BLOODSUCKING DIPTEROUS INSECTS IN THE TUNDRA FORESTS OF THE TAIMYR PENINSULA (Izuchenie vidovogo sostava i dinamiki aktivnosti krovososushchikh dvukrylykh nasekomykh v lesotundre Taĭmyra).

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D.V. Savel'ev

Kand. S. Kh. Nauk, NIISKh
of the Far North

STUDY OF THE SPECIES COMPOSITION AND THE DYNAMICS OF THE BLOODSUCKING DIPTEROUS INSECTS IN THE TUNDRA FORESTS OF THE TAĬMYR PENINSULA.

Almost all the representatives of the group of bloodsucking dipterous insects are widely prevalent in the vast expanse of the Far North and their number is exceptionally high. They considerably interfere with the exploitation of the natural wealth in the North and cause great damage to the breeding of the northern deer every year. Maximum damage is done by mosquitoes, midges and gadflies. Damage caused by midge bites is greatest in the southern areas, Tundra forests and in the taigas. When the bloodsucking dipterous insects are active, they cause great discomfort to the deer who get exhausted and whose resistance to sickness falls sharply.

The species composition of the bloodsucking insects and the dynamics of their flight in the Far North have been little investigated so far. Domestic and foreign literature giving data on their biology and ecology is extremely scanty. Some information on the fauna of mosquitoes in the western part of the Taimyr Peninsula has been communicated by Kiseleva

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(1936); also a short summary on the species composition of the mosquitoes of the North has appeared (Rumsh, 1948). Papers by From (1955-1956) give data on the fauna and ecology of mosquitoes of Alaska ; a summary thereon has also been given by Glyullin and others (1961).

Work on this section of the subject was initiated in 1958. Its executor was A.M. Vol'ftrub, a coworker in the military scientific laboratory on the control of gadflies and bloodsucking dipterous insects. This work was completed in 1962. Observations were carried out in 1958 in the neighbourhood of Noril'sk and subsequently in the area of spring, summer and autumn deer pastures in the OPKh Institute in the vinicity of 50 - 150 km. from Potapovo.

Mosquitoes: In order to study the species composition, a systematic examination of water reservoirs and a collection of larvae and pupae of these insects were conducted. The material collected was screened and a portion of the larvae and pupae was held over for breeding imago. In addition to this, adult insects were also collected. Numerical stock of the adult insects was taken according to the generally accepted method. The chamber treatment and the determination of the species were carried out in the Zoological Institute of Ya ASSR. Shallow reservoirs and Tundra marshlands were the principal

habitats of the mosquito larvae. However, a small number of them were also found in small lakes. The first larvae of the season appeared in temporary reservoirs when the lakes were still under ice. They could be usually detected at the beginning or at the end of the first ten days of June. In the years when the spring was cold and prolonged, considerable variation was found in their growth period. Thus for instance, it was possible to detect the first larvae in 1958 in the vicinities of Norilsk only during the second ten days of June. Upto 80% of the larvae already in the 3rd - 4th stages usually existed in the reservoirs at the end of the second ten days of June. This delayed appearance occurred only in those years when spring was too cold. The first pupae were most commonly recordéd between the end of the second and the beginning or the end of the third ten days of June. The last papas were detected on the 16th of July. In the year 1961, which was cold, larvae and pupae were met with till the end of July. While identifying the collection of larvae and the male mosquitoes, 10 types were established, eight of them being the genus Aedes and two of them being the genus Teobaldia (see the tbble).

Those belonging to genus Teobal'dia were the hibern ting females. The breeding of the species Aedes outstripped their appearance. During 1958-1959

they emerged during the first ten days of June. Their number, however, was not highly significant even once. Mosquitoes of the genus Aedes made their appearance from the very end of June to the beginning of July. The mass flight usually commenced towards the end of the first or second ten days of July. The number of mosquitoes remained high till the end of July. Their number was considerably less in August. The peaks of their activity were noticed only on isolated and more favorable days. Isolated mosquitoes flew till the end of August and sometimes also on the first few days of September. Thus intensive flight of mosquitoes usually lasted for 20-25 days in Dudin area. The comparatively short duration of this period was compensated by the extremely large number of mosquitoes and by their active invasion.

Table 1 [See page 5]

Table 1

Species composition of mosquitoes in the Dudin area of Taïmyr National District.

Species	Percentage	
	Year 1960	Year 1961
Aedes kommunis	44	68.1
" impiger	20.3	17.1
" excrucians	17.5	-
" migripes	10.6	0.6
" hexondontus	6.0	7.1
" punktor	1.6	3.9
" pinonips	1.0	3.2
" intrudens	1.0	-
Teobaldia alyaskenzis	1.0	1.0
" bergrotti.	1.0	1.0

Black flies (Simuliidae): In the pre-imago stages they are found in bulk in the numerous quick flowing brooks. Many larvae and pupae were particularly noticed in 1960 on submerged stones in the river Dudink and in 1961 on the river Avamskaya and on the numerous canals joining the Tundra lakes. In view of the fact, that in the majority of the cases

the observer was late in reaching the places where the black flies were abundant in the imago phase of their development, no conclusive data about their development are available. By the 15th of August the larvae and pupae became fewer in number and by tne end of the month they disappeared altogether.

The adult black flies always appeared later than the the beginning of the mass flight of mosquitoes. Thus the first black flies were recorded on the 11th of July in 1958; on the 26th of June in 1959; and, as an exception, at the end of the third ten days of June in 1961. The mass flight of the black flies commenced in the middle of June, attained the highest rate in the third ten days of the month, and thereafter their number dropped appreciably. In 1960 the mass flight of these insects continued for three days, from 15th to 18th of July. Isolated black flies, however, held out till the 12th of August in that year. In 1961 when the black flies made late appearance their maximum number was observed from the middle to the end of August. The last black flies held out till the middle of the first ten days of September.

Horseflies (Tabanidae) : Inx all the years under observation, the flight of the horseflies was intense but not prolonged. Horse-flies appeared in the first or the second ten days of July.

July.

July. Their mass flight which was noticed in the second ten days continued till the end of the month. Only isolated flies were found flying from the second half to the end of August. It should be mentioned that a certain rise in the number of horseflies was noticed from year to year. On the days of mass flight (in 1958) isolated horseflies already started appearing by 3 - 4 o'clock in the morning; with the rise in air temperature their number sharply increased from 9.30 to 10 A.M. They continued to be active till 17 - 18 hours. A certain rise in flight activity was sometimes noticed in the late evening hours also.

Indentification of the species affiliation of the imago of the horseflies was carried out by the executor under the guidance of N.G. Ol'sufeva and A.S. Lutta. In all, 445 specimens comprising the following species were identified.

1. Tabanus lapponikus
2. " lyuridos
3. " arpadui
4. " flavipes
5. " borealis
6. " ful'vikornis
7. " montanus
8. " komfinis
9. " Khrizozona nigripes.

Biting midges (Heleidae): Some of the specimens of the biting midges which gathered on Valk (69° 24' north latitude) proved to be a case of sudden windfall. According to the data of A.V. Gutsevich (1956), Yuskin, a lake in Kol'skoi peninsula (68° 15' north latitude) and also Kamenk, a village on the bank of the river Pachore (67° 35' north latitude) were considered to be the most northern points of the occurrence of these insects.

Professor A.V. Gutsevich kindly agreed to identify these collections of insects and established two species among them: Kulikoides fostsipennis and Kulikoides pulikarius.

Conclusion

1. Species composition of the blood-sucking dipterous insects - 10 species of mosquitoes, 9 species of horseflies and 2 species of biting midges-was investigated.

2. Mosquitoes appear to be the most numerous among the whole complex of the blood-sucking dipterous insects. They are responsible for the greatest damage to deer breeding. They appear from the end of June to the beginning of July but are active till the middle of August.

3. The main bulk of the mosquito larvae develops in numerous reservoirs filled up with thaw and rain water, in the stagnant areas and in the ancient beds of lakes.

4) Horseflies and midges appear later than mosquitoes.

5) This work is the first step in the study of the complex of the bloodsucking insects in the Taĭmyr peninsula and must be extended to cover the remaining areas.

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